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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,594	11/26/2003	Yuan-Ping Pang	07039-161002	7578
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FISH & RICHARDSON P.C. PO BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER NEGIN, RUSSELL SCOTT	
			ART UNIT 1631	PAPER NUMBER
			MAIL DATE 09/07/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/723,594

Applicant(s)

PANG, YUAN-PING

Examiner

Russell S. Negin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 15 June 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 and 25-72 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 and 25-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-72 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 15 June 2007 has been entered.

Claims 1-18 and 25-72 are pending and claims 37-72 are examined.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The following rejection is newly applied:

Claims 37-72 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The following analysis of facts of this particular patent application follows the analysis suggested in the "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility". Note that the text of the Guidelines is italicized.

To satisfy section 101 requirements, the claim must be for a practical application of the § 101 judicial exception, which can be identified in various ways (Guidelines, p. 19):

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- The claimed invention "transforms" an article or physical object to a different state or thing.
- The claimed invention otherwise produces a useful, concrete and tangible result.

In the instant case, the claimed invention does not "transform" an article or physical object to a different state or thing because the claimed method is a molecular simulation of a metal that occurs within a computer. This does not preclude the subject matter to be patentable as, for eligibility analysis, as

*physical transformation "is not an invariable requirement, but merely one example of how a mathematical algorithm [or law of nature] may bring about a useful application." AT&T, 172 F.3d at 1358-59, 50 USPQ2d at 1452. If the examiner determines that the claim does not entail the transformation of an article, then the examiner shall review the claim to determine if the claim provides a practical application that produces a useful, tangible and concrete result. In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." The claim must be examined to see if it includes anything more than a § 101 judicial exception. If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101. If the examiner does not find such a practical application, the examiner has determined that the claim is nonstatutory. (Guidelines, p. 20)*

The question is thus whether the final result achieved by the claimed invention satisfies all three criteria of being useful, and concrete, and tangible.

Furthermore, the useful, tangible, and concrete result must be recited in the claim itself, rather than addressed in specification.

(2) **"TANGIBLE RESULT"** The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible

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requirement does require that the claim must recite more than a § 101 judicial exception, in that the process claim must set forth a practical application of that § 101 judicial exception to produce a real-world result. The opposite meaning of "tangible" is "abstract."

The instant claims are drawn to machine for simulating the properties of metal ion. However, as claimed, the machine does not produce a tangible result. For example, the machine as claimed can produce results that take place entirely within the confines of a computer or a human mind without any communication to the outside world and without using or making available for use, the results of the computation. Although a representation is generated (i.e. instant claim 37), it is unclear to where the result is generated (i.e. computer display, computer memory). For example, the generated representation can be directed to a carrier wave, *per se*, which is not statutory. Thus, the instant methods of the claims do not produce any tangible result.

Therefore, the final result achieved by the claimed invention does not satisfy all three criteria of being useful, and concrete, and tangible.

### ***Claim Rejections - 35 USC § 112***

The rejections of claims 52, 53, 70 and 71 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention are withdrawn in view of amendments made by applicant to the set of claims filed on 15 June 2007.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 37-72 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 37, line 5, the phrase "generating a representation of a metal ion," it is unclear if "a metal ion" is the monoatomic metal ion referred to in line 4, or if the metal ion is a polyatomic metal ion. Each of these two possible interpretations results in independent indefiniteness rejections.

If "a metal ion" is a "monoatomic metal ion" as indicated in line 4, it is unclear how "a metal ion" with a center atom and dummy atom which is polyatomic can be monoatomic at the same time.

On the other hand, if a metal ion is not limited to being monoatomic, then there exists a gap between the first and second method steps of instant claim 37. In other words, the monoatomic metal ion of the first method step has no role in the second method step.

Claim 55 recites the limitation "the metal ion" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is unclear if "the metal ion" is the monoatomic metal ion referred to in line 2, or if the metal ion is a polyatomic metal ion. Each of these two possible interpretations results in independent indefiniteness rejections.

If "then metal ion" is a "monoatomic metal ion" as indicated in line 2, it is unclear how "a metal ion" with a center atom and dummy atom which is polyatomic can be monoatomic at the same time.

On the other hand, if a metal ion is not limited to being monoatomic, then there exists a gap between the first and second method steps of instant claim 55. In other words, the monoatomic metal ion of the first method step has no role in the second method step.

While claim 37 recites that the dummy atoms must have a positive charge, it is unclear as to how claims 52-53 can recite the possibilities that the dummy atoms can have charges of  $-0.5$  and  $-0.3333$ , respectively.

While claim 55 recites that the dummy atoms must have a positive charge, it is unclear as to how claims 70-71 can recite the possibilities that the dummy atoms can have charges of  $-0.5$  and  $-0.3333$ , respectively.

### ***Claim Rejections - 35 USC § 103***

The rejection of claims 37-47, 49-65, and 67-72 under 35 U.S.C. 103(a) as being unpatentable over Huheey et al. [Inorganic Chemistry, Fourth Edition, 1993, HarperCollins College Publishers] in view of Marchi et al. [Journal of Physics: Condensed Matter, volume 2, 1990, pages 5833-5848] as evidenced by Crawford [CH186 Lecture Presentation: Transition Metal/Coordination Chemistry accessed at <http://chemistry.semo.edu/crawford/ch186/lectures/ch20/index.html> on 5 January 2007, last updated on 25 February 1999] is withdrawn in view of amendments made by applicant to the set of claims filed on 15 June 2007.

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The rejection of claims 37, 48, 55, and 66 under 35 U.S.C. 103(a) as being unpatentable over Huheey et al. as evidenced by Crawford in view of Marchi et al. as applied above, and further in view of Maggiora [Journal of the America Chemical Society, volume 95, 1973, pages 6555-6559] is withdrawn in view of amendments made by applicant to the set of claims filed on 15 June 2007.

### ***Response to Arguments***

Applicant's arguments filed 15 June 2007 have been fully considered and they are persuasive in light of the amendments filed on 15 June 2007.

### ***Conclusion***

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the central PTO Fax Center. The faxing of such pages must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center Number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Negin, Ph.D., whose telephone number is (571) 272-1083. The examiner can normally be reached on Monday-Friday from 7am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Marjorie Moran, Supervisory Patent Examiner, can be reached at (571) 272-0720.

Information regarding the status of the application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



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For more information on the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*K 8/22/07*

RSN  
22 August 2007

/Shubo (Joe) Zhou/

SHUBO (JOE) ZHOU, PH.D.  
PRIMARY EXAMINER